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# Variants on a Theme: A Comparison of Five Dolmens of the "Hire Benakal Type"

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## Introduction

Megalithic monuments are found all over the Indian subcontinent, though the vast majority of these are distributed in peninsular India, with sparser distribution in the north (Moorti 1994, 2008; Brubaker 2001). Though generally ascribed to the south Indian Iron Age (Moorti 1994, 2008; Sundara 1975), their origins could well go back to the Neolithic, and megalith construction might have lasted into the Early Historic period (Morrison 2005, 2009, Menon 2012a, 2012b). Megalithic monuments vary widely in form, from simple erect standing stones called menhirs to elaborately conceived and executed dolmens and rock-cut tombs (Moorti 1994, 2008, Menon 2012a, 2012b). Certain megalithic forms, such as the boulder circle and the dolmen are found widely distributed throughout the range of occurrence of megaliths, whereas some are endemic to certain regions – like the *kodakkals* and *topikkals* of Kerala (Brubaker 2001, Menon 2012a). Some Indian megaliths also show remarkable similarity in form to similar monuments elsewhere in the world (Menon 2012a).

However, even within their range of distribution in the subcontinent, megalithic monuments grouped under the same category can exhibit differences in design, detailing, etc. Sundara (1975) has tried to account for these differences by adding the name of a type-site to the names of these megalithic forms. For instance, he differentiates between what he calls "port-holed chambers" of the Hire Benakal type and the Rajan Koluru type (Figures 1 and 2), based on dimensions and design of the structures.

In this paper, we will examine the design of four dolmens of the Hire Benakal type found at different places in south India. Though these structures are quite similar in design, they exhibit subtle differences in detailing, orientational preferences etc.

## The Megalithic Type-site at Hire Benakal

Hire Benakal is a village accessed from the Gangavati – Koppala highway in Koppala district in northern Karnataka. The megalithic site in the boulder-strewn granite outcrops near Hire Benakal was first noticed by Rev. Keis (Taylor 1941) and others, but the first detailed studies were carried out later by Sundara (1975). This extensive megalithic site (Figure 3), locally known as Moriyara Guddahas has 283 megalithic structures as surveyed by Sundara (1975), but a staggering 1003 structures of various forms have been reported in an extensive survey carried out by Bauer (2015). The various monuments encountered at Hire Benakal include menhirs,

stone circles, cists and cairns, but it is the category of megalithic monuments designated loosely as "dolmens" that constitute nearly 70% of all structures (Bauer 2015). The megaliths, which are all made of the local stone – granitic gneiss, are distributed in three clusters – the western, the central and the eastern groups, separated by low granite outcrops. This site is currently a protected site of the Archaeological Survey of India.

Figure 1: A typical "Hire Benakal type" of port-holed dolmen

Figure 2: A typical "Rajan Koluru type" of port-holed dolmen

Figure 3: The extensive megalithic site at Hire Benakal

Figure 4: A typical IPC with its rubble packing mostly intact

Figure 5: An IPC at Hire Benakal with its rubble packing missing

Figure 6: A dolmenoid cist at Hire Benakal **(**The scaling rod is 1m tall**)**

Figure 7: Port-holed dolmens of the central group at Hire Benakal. Note how the porthole is circular when it is in the centre of the orthostat and semicircular when it is on the edge

Figure 8: A bit of surviving coursed masonry wall is visible at the base of the dolmen in the centre of the frame

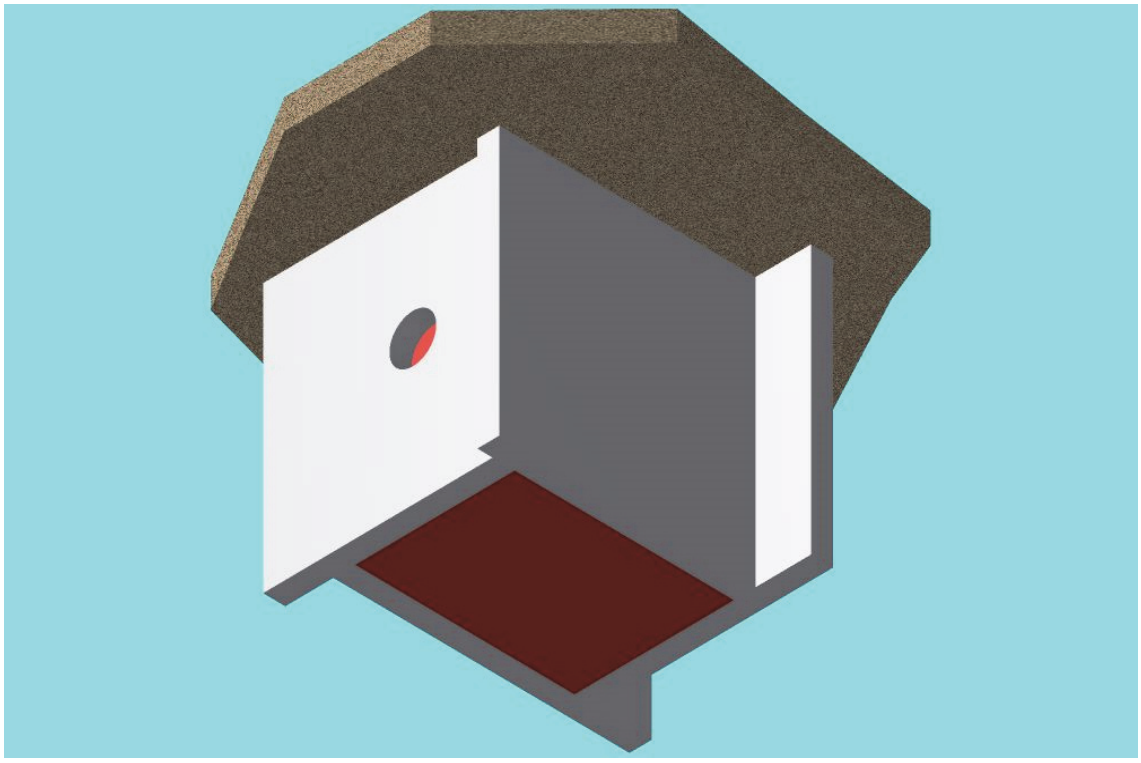


Figure 9: An illustration of the way orthostats are placed to prevent inward collapse

Figure 10: A view of the large dolmen of the central group which is described in the text

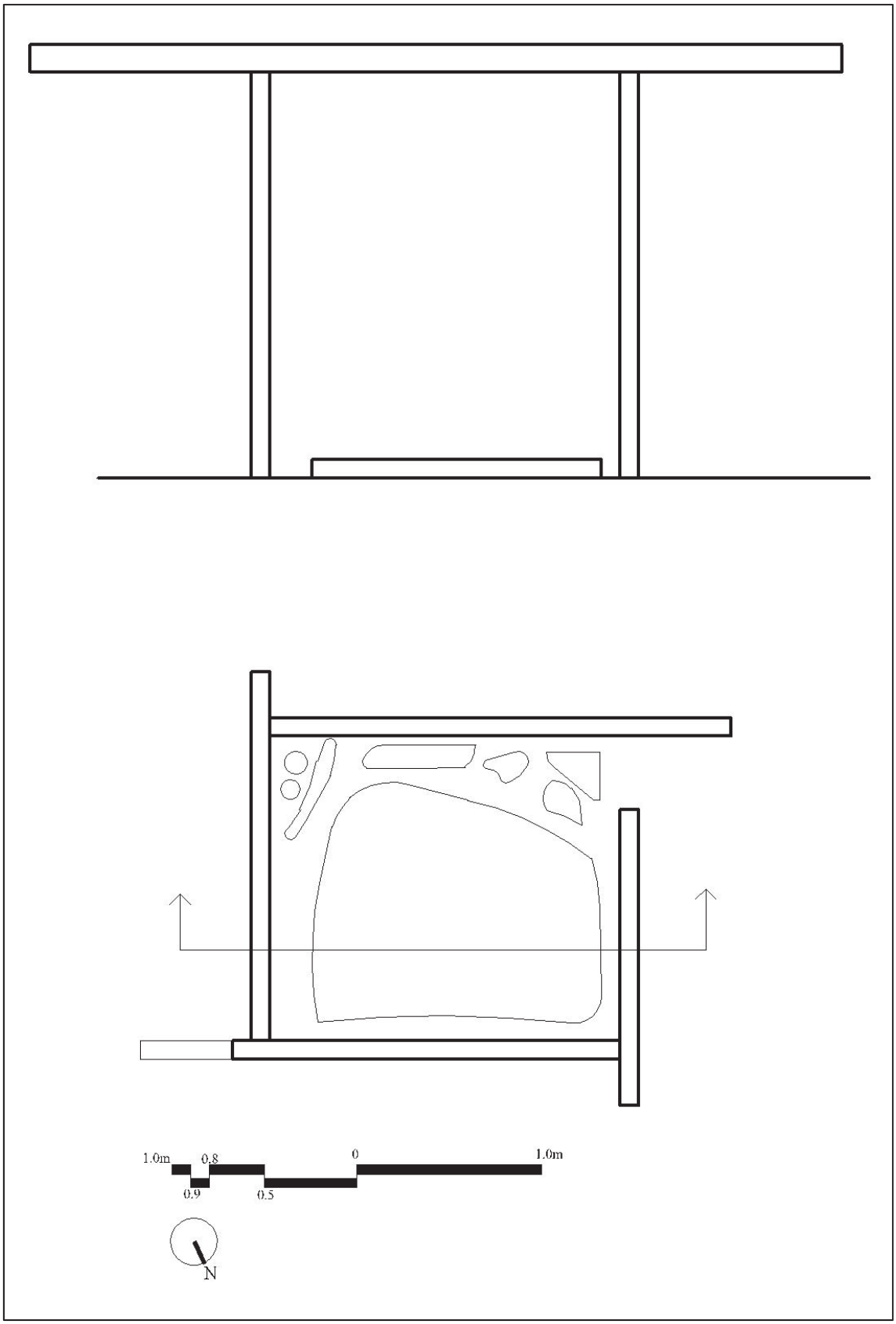



Figure 11: Plan (below) and section of the dolmen at Hire Benakal

The "dolmens" of Hire Benakal are of three main types: The Irregular Polygonal Chamber (henceforth IPC), the Dolmenoid Cist and the Dolmen. An IPC consists of a circular or irregular stone slab called a capstone supported on small natural boulders or chipped stone pieces (Figure 4). Originally these were packed with stone masonry blocks on all sides, leaving a small opening on any one side. However, this packing has been lost in most cases, leaving only the capstone and supporting boulders (Figure 5). The height of this type of structure is low, measuring from 0.40 – 0.6m from the ground to the underside of the capstone. This type of megalith is predominant in the western group at the site.

The dolmenoid cist (Figure 6) consists of four stone slabs on end (called orthostats) arranged to make a rectangular enclosure and surmounted by a heavy capstone. The walls are surrounded by a packing of coursed masonry blocks up to the capstone on three sides and a circular porthole is located on the fourth slab close to the ground level. The masonry packing is covered by other stone slabs with one end resting on the ground and the other on the edge of the capstone. The orthostats of this megalith type are driven partly into the ground, this being the main characteristic (other than dimensions) that differentiate it from the dolmen. The enclosure within the dolmenoid cists are around 1.2 – 1.5m square and the height from the ground to the capstone is roughly 0.75m. Often, two small slabs are placed flanking the porthole to make a passage. These megaliths are also encountered more in the western group.

The dolmen (Figure 7) is a larger version of the dolmenoid cist, and they are also erected on rocky ground, the orthostats stand directly on the rock surface and are not embedded in the ground like the dolmenoid cists. The rectangular space enclosed by the orthostats in dolmens roughly measure the same as dolmenoid cists, but the height from the ground to the capstone is usually 2.0 – 2.2m. Though all the dolmens of the site are disturbed in varying degrees, there is evidence for coursed masonry blocks outside some dolmens (Figure 8). Some dolmens have only three orthostats, leaving the fourth side open, but those with all four orthostats usually have a circular porthole in the centre of one of the slabs or a semi-circular opening at the bottom of the slab. The portholes are generally facing east or west, though northerly, or even southerly orientations are not too uncommon. There are dolmens with four orthostats that do not have a porthole as well. Usually there is a large slab forming the floor of the enclosure within the orthostats. This type of megalithic structure is encountered mostly in the central group but also in the eastern group.

Both the dolmen and dolmenoid cist have been classified as "slab supported dolmens" by Bauer (2015). In this paper, however, the term "dolmen" will be used for the large dolmens illustrated in Figures 7 and 8. Both the dolmen and the dolmenoid cist have their orthostats arranged such that each orthostat overlaps the edge of the next one by several centimeters, in a clockwise or contra-clockwise manner (Figure 9). This ingenious arrangement is in order to prevent inward collapse of the orthostats. Outward collapse is prevented by the coursed stone masonry walls surrounding the orthostats, which might have been covered by additional stone slabs resting against the edge of the capstone, like in the dolmenoid cists.

## A Detailed Examination of One of the Dolmens at Hire Benakal

One of the large dolmens of the central group at Hire Benakal is examined in detail in this section. This dolmen (Geo-coordinates: 15° 24' 59".76N, 76° 27' 21".24E) consists of four orthostats surmounted by a capstone and lacks a porthole (Figure 10, Figure 11). It is aligned

very roughly to the cardinal directions, with the azimuth of one of the east-west orthostat is 64.5°. It is to be noted that the construction of the enclosure is not precisely rectangular and the orientations of different orthostats may be off by 5 degrees or more. One of the orthostats measures 2m x 2.2m, while others are 2.5m x 2.2m, 2.1m x 2.2m and 1.6m x 2.2m in size, 2.2m being the height of the slabs. All the slabs are roughly 10cm thick. The northern orthostat is only 1.6m in width leaving a slit opening of roughly 40cm – whether this was the case originally or it is the result of the attentions of generations of treasure seekers who have vandalised nearly all the monuments at the site is a matter of conjecture. A large slab, broken towards its westerly edge forms the floor of the enclosure, which measures 1.3m x 1.4m. The large capstone is irregularly cut and has a maximum overhang of 1.2m beyond the line of the orthostats (Figure 12).

The area around this dolmen is littered with stone masonry blocks which could have formed the outer coursed wall before it was disturbed. There are no signs indicating that an outer covering of slabs existed beyond this coursed masonry wall. Smaller stone chips lie scattered on top of the capstone, indicating that perhaps the complete monument might have resembled a mound.

## The Megalithic Site at Mallasandram

The megalithic site at Mallasandram (Figure 13) is situated on the rock summit plateau of a hill located 16km northwest of Krishnagiri Town and District Headquarters in Tamil Nadu. It is best accessed from the village at the base of the hill called Birpallam (also called Birpalli), which is reached by taking a deviation to the northwest from Samalpallam on the National Highway 7 connecting Krishnagiri with Bangalore. This well-known megalithic site is not very well covered in the literature on megaliths. Tilner (2004) briefly describes it in comparison with similar sites at Iralabanda and Mallelabanda.

The megaliths, mostly various types of dolmens, are scattered in three clusters on bare rocky patches near the summit of the hill. The site has more than 186 dolmens as per numbering done by the local forest department. Only one IPC (not numbered) could be detected in a visit to the site in 2014, in the central cluster. Moving among the clusters of dolmens, one is struck by the similarity of the general perception of the site to Hire Benakal, though individual dolmens differ in many respects to those at Hire Benakal (Figures 14 and 15). The basic dolmen type is similar to that at Hire Benakal, but they are surrounded by slab circles of various types. The main types of monuments at Mallasandram are dolmens without slab circles, dolmens surrounded by slab circles comprising of large slabs with curved tops and one example of a dolmen enclosed in a large mound bounded by a slab circle resembling a stupa (Menon, in prep.). This site too is not an exception to plundering by treasure seekers and it is quite possible that the dolmens without slab circles have lost the outer slabs due to vandalism. All the monuments at Mallasandram are aligned quite precisely to the cardinal directions, with the porthole invariably in the eastern orthostat. A few of the dolmens have paintings in white executed on the inside surfaces of the orthostats. It is not clear whether these paintings post-date the monuments.

Dolmens without slab circles (Figure 16) are noticed to be in advanced state of dilapidation, suggesting that they have been deprived of the slab circles that once surrounded them. This view is reinforced by some examples (Figure 17) where the shape of the coursed masonry wall

that surrounds the orthostats clearly gives away the former presence of the slabs that contained them. Dolmens with one as well as two surrounding slab circles are encountered (Figure 18). Each slab circle consists of alternating tall slabs with rounded tops and short slabs with flat tops. The outer circle is diminished in height in comparison to the inner one.

Figure 12: Another view of the same dolmen clearly showing the overhang of the capstone beyond the orthostats

Figure 11: A view of the dolmens of the central cluster at Mallasandram

Figure 12: A view of the megalithic site at Mallasandram is similar to that at Hire Benakal

Figure 13: A view of the megalithic site at Hire Benakal is similar to that at Mallasandram

Figure 14: A dolmen without surrounding slab circles at Mallasandram

Figure 17: The shape of the encircling walls of coursed stone masonry clearly shows that a bounding slab circle once existed

Figure 18: A dolmen with two encircling slab circles at Mallasandram

Figure 19: A unique megalithic monument which could be a "proto-stupa" at Mallasandram

One of the unique dolmens encountered at Mallasandram is a dolmen with a surrounding circle of slabs of equal height fitted tightly and held in place by huge blocks of stone at the base (Figure 19). The intervening space seems to have been filled up with rubble, which survives only in one quadrant of the circle due to vandalism. The overall effect seems to be that of a primitive stupa. There are other similar monuments on smaller scales, too (Figure 20).

Figure 20: Similar monuments on a smaller scale at Mallasandram

Figure 21: The dolmen with double slab circle at Mallasandram

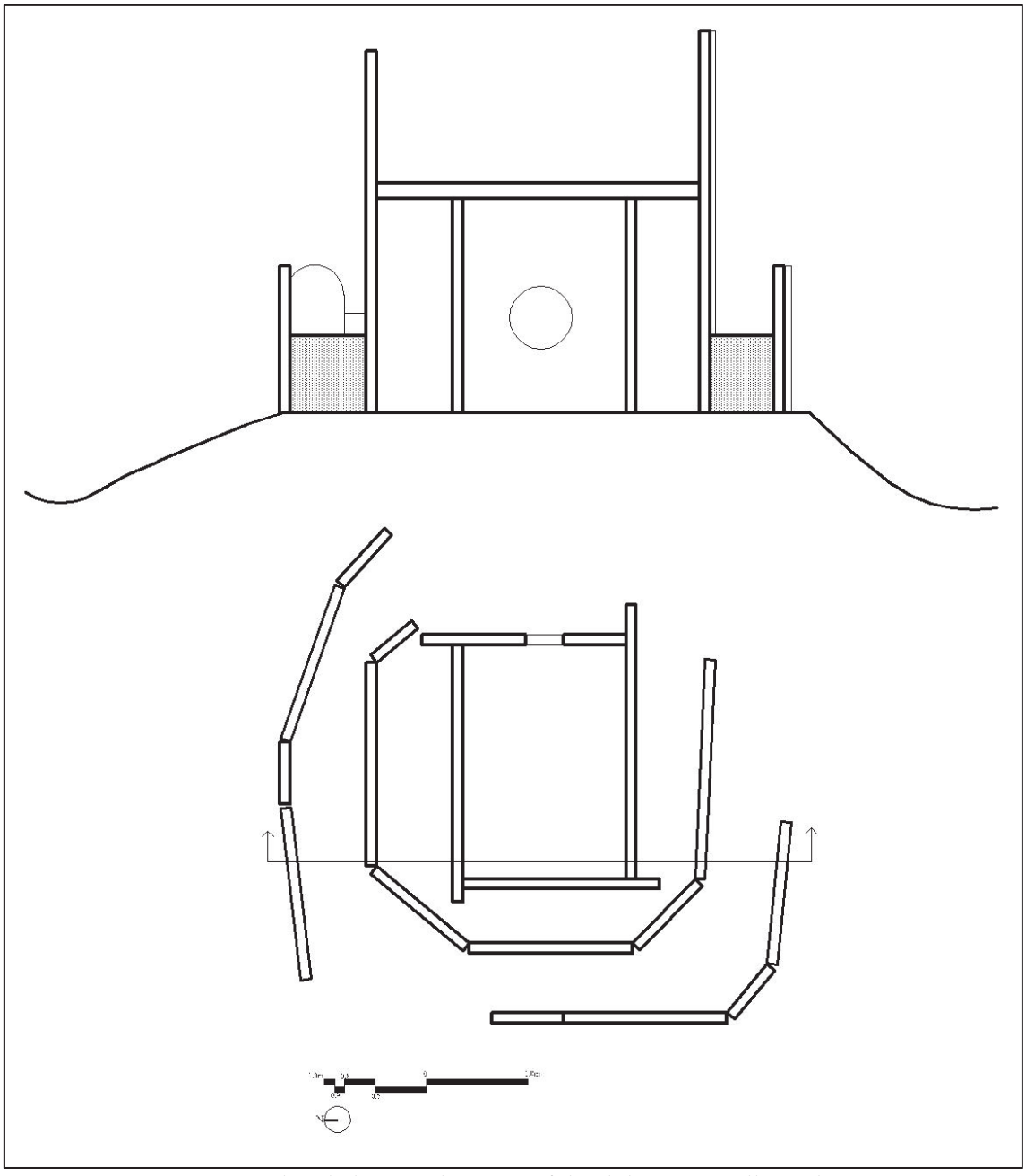


Figure 22: Plan (below) and section of the dolmen at Mallasandram

## A Detailed Examination of One of the Dolmens at Mallasandram

One of the dolmens (Geo-coordinates: 12° 38′ 11″.0N, 78° 05′ 55″.2E) with a double slab circle in the central cluster at Mallasandram (Figures 18, 21 and 22) is described in detail below. The central structure in this megalith is a Hire Benakal type of dolmen, with overlapping orthostats to prevent inward collapse, measuring 1.6m x 2.3m on the inside, with a porthole of 36cm diameter on one of the shorter sides facing east. The height from the floor of the dolmen to the bottom of the capstone is 2.1m. The slabs are all roughly 10cm thick. These orthostats are surrounded by a coursed stone masonry wall having a thickness of 53-58cm. A portion of this wall is destroyed on the eastern side. This wall is bounded by three large slabs with rounded

tops on the eastern, southern and western sides. These slabs measure 2.2m, 1.6m and 2.0m respectively in width and are about 3.7m tall. Three slabs, slightly shorter than the capstone alternate with these three large slabs, to form what must have been an 8-sided polygon, possibly with two slabs flanking the porthole in the east to form a passage as seen from other examples on the site. However, today only six slabs from the inner circle survive. The outer edges of the capstone have been shaped to fit the outline defined by this surrounding slab circle (Figure 23).

The inner circle is surrounded by another lower coursed masonry wall about 75cm in thickness, which is bound by an outer circle of lower slabs, similarly alternating between round- and flat-topped slabs. Only eight stones, four in the southwestern quadrant and four in the north-eastern quadrant survive currently.

The structure is surrounded by a profusion of chipped stone blocks that formed part of the masonry walls that are now partly destroyed from this and other megaliths (Figure 24).

## The Megalithic Site at Konaje Kallu

The megalithic site near Konaje Kallu, locally known as Merane Pathe, is situated 6km towards east of north east of Moodbidri Town in Dakshina Kannada District of Karnataka (Figure 25). The site contains two more or less intact dolmens (Figure 26), one on the summit of the rocky hill and three collapsed dolmens, as well as several IPC's (possibly 6 extant ones and debris indicating a few destroyed ones) (Figure 27) and three cairns of heaped earth and rubble with quartz scatters (Figure 28) which could also be destroyed IPC's. The dolmens are called "*Pandavara Goodu*" by the locals. There is also a feature akin to what Morrison, Lycett and Trivedi (in press) labels as "crack features" – an important new adjunct found at megalithic sites in north Karnataka, such as Hire Benakal (Figure 29). Crack features seem to be deliberate filling of crevasse-like features in the natural bedrock with unmodified boulders or chipped stone blocks. What role they might have played in megalithic complexes is not known.

## A Detailed Examination of Two of the Dolmens at Konaje Kallu

The two relatively less-disturbed dolmens at Konaje Kallu are described here. The dolmen on the slope of the hill (Geo-coordinates: 13° 05′ 09″.7″N, 75° 03′ 30″.7E) is typically of the Hire Benakal type, with the distinct arrangement of orthostats, but the slabs are rough-cut, with two of them extending by as much as 1.12m and 1.26m beyond the adjoining orthostats (Figure 30; Drawing 31). The space enclosed by the orthostats is 1.92m x 1.13m. The height from the ground surface outside the dolmen to the bottom of the capstone is 1.76m. There is a filling of earth within the dolmen till slightly below the bottom rim of the porthole. The dolmen is east-facing (azimuth 100°), with the porthole of 37cm diameter in the eastern slab. A broken slab is embedded in the ground parallel to and outside the southern orthostat, is possibly one of the only surviving remnants of an outer casing of slabs, along with another that leans on the southern orthostat.

The second intact dolmen is on the summit of the hill and is also east-facing (Figure 32; Drawing 33). Similar in construction to the other dolmen, this one too has orthostats extending a long way beyond the edge of the adjoining orthostats (by 0.87m, 0.44m, 1.12m and 0.67m), though these measurements are not uniform, these being roughly cut slabs with irregular edges. The space enclosed by the orthostats measures 1.92m x 1.43m. This dolmen too, has a broken

and splayed slab parallel to, and outside the southern orthostat. However, there is a broken slab embedded within the dolmen too, prompting speculation if it might have been transepted from within. The main difference between this dolmen and the one downhill is that this has two short stone slabs flanking the oval shaped porthole (horizontal: 34cm and vertical: 29cm) to create a passage (Figure 34). The interesting feature is that the porthole is polished to a "bull-nosed" finish (Figure 35) – the only example of such a finish in a porthole encountered so far in this study. The slabs that comprise the orthostats vary from 10cm to 22cm in thickness, while the capstone varies from 8cm to 15cm.

There is a laterite plinth, possibly from a later period, to the south of this dolmen. It is said that the shrine to Brahma or Bermeru (names for a "spirit-deity" under the local tradition of ancestor-worship in this region) was located here, before being moved downhill, where it is situated currently. The capstones of both dolmens exhibit signs of breakage, maybe to plunder the contents.

## The Megalithic Site at Kakkunje

The megalithic site at Kakkunje, near Halladi-Harkadi in Kundapura Taluk of Udupi District in southern Karnataka, was first reported by Shetty (1990). Even at the time of the discovery, only one dolmen (referred to as "port-holed cist" in the report) was more or less intact (Figure 36), with the ruined remnants of 11 other megaliths, including a stone circle, scattered within 750m of the intact dolmen. During this study, in two visits, only the remains of two dilapidated dolmens (Figure 37), other than the relatively intact dolmen, could be found. The others might have been missed due to the dense post-monsoonal overgrowth. There is the possibility of the remains being plundered, too, with several orthostat-like stones used to pave a couple of platforms in the vicinity.

Figure 23: Outer edges of the capstone shaped to fit the outline dictated by the inner slab circle

Figure 24: The profusion of chipped stone blocks from the coursed walls around the dolmens litter the space between the monuments

Figure 15: A general view of the megalithic site at Konaje Kallu

Figure 26: One of the intact dolmens at Konaje Kallu

Figure 16: One of the IPC's at Konaje Kallu

Figure 17: A heap of earth, rubble and quartz scatter that could be a cairn or the site of a destroyed dolmen or IPC at Konaje Kallu

Figure 18: A possible "crack feature" like the ones identified at Hire Benakal and other places in north Karnataka by Morrison (2009)

Figure 30: The intact dolmen on the slope of the hill at Konaje Kallu described in this paper

## A Detailed Examination of One of the Dolmens at Kakkunje

The only surviving dolmen at Kakkunje (Geo-coordinates: 13° 32′ 39″.7N, 74° 49′ 37″.2E) was studied (Figure 38). The dolmen is west-facing (Azimuth: 263°), with the porthole, measuring 49.5cm horizontally and 44.5 vertically, on the western orthostat. However, Shetty (1990) mentions that the porthole was seen on the eastern orthostat which was still extant on one of the other collapsed dolmens he noticed to the southeast of this dolmen. Three of the orthostats and the capstone are still extant, with the fourth (northern) orthostat seemingly prised apart by those who must have plundered the tomb (Figure 39). The area enclosed by the orthostats measure roughly 2.4m x 2.1m. The height from the floor of the enclosure, which is sunk 7.5cm below the ground level outside, to the bottom of the capstone, is 1.5m. The orthostats exhibit the interlocking pattern typical of the Hire Benakal type of dolmens. The interesting feature of this dolmens is the inward curvature, towards the top, of the eastern and western orthostats. Upon closer examination, it can be discerned that curvature in the eastern orthostat (Figure 40) is entirely natural, with the slab probably being extracted from the curved cortex of a rock bed. The western orthostat (Figure 41), on the other hand, bears distinct signs of having been shaped to mirror the curvature in the eastern orthostat. Such a shaping of an orthostat for purposes of symmetry has not been reported from any other megalithic site, as far as can be ascertained.

"Technically speaking, this dolmen can be classified as a dolmenoid cist of the Hire Benakal type, rather than a dolmen, because, unlike the other four examples discussed above, the orthostats of this structure do not stand directly upon rocky ground and are embedded in the ground. Also, the porthole is relatively closer to the ground than in the other dolmens. However, because of the height which is closer to the examples discussed, it is considered alongside these."

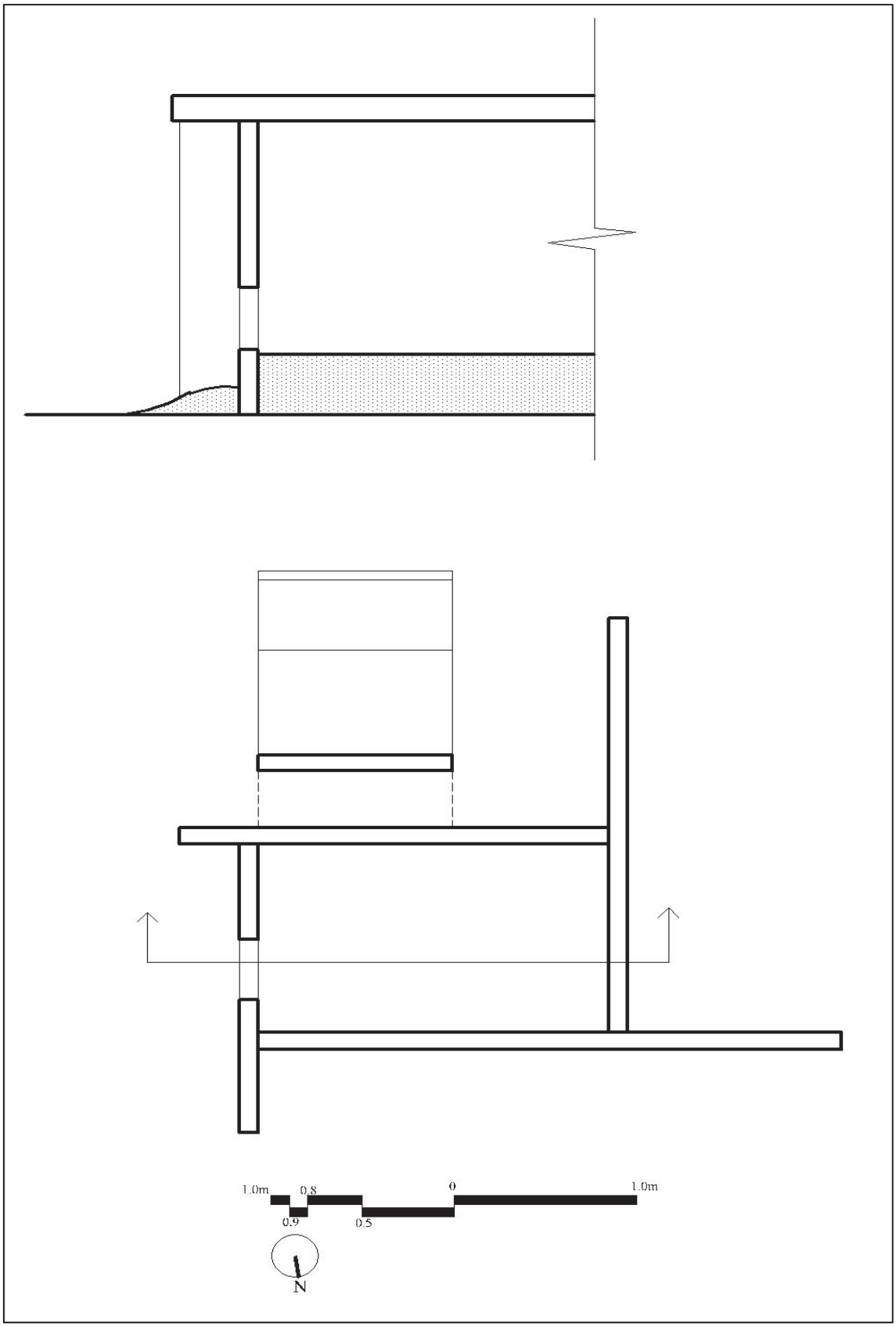



Figure 31: Plan (below) and part-section of the dolmen on the slope at Konaje Kallu

Figure 32: The intact dolmen on the summit of the hill at Konaje Kallu described in this paper

## Discussion

The other three sites discussed above are at considerable distances away from Hire Benakal. Mallasandram is the most removed, being 355km to the southeast, while Kakkunje and Konaje Kallu are 270km and 300km to the south. Kakkunje and Konaje Kallu are relatively close to each other, the former just 56km north of the latter. Mallasandram is 370km to the southeast of Kakkunje and 333km from Konaje Kallu. Thus, we can think of these sites as belonging to three regions – the Hire Benakal region, the Kakkunje-Konaje Kallu region and the Mallasandram region. It would be interesting to investigate other sites in these three regions to continue the work done in this study. What immediately comes to mind are the megalithic sites at Iralabanda, Mallelabanda, etc. near Mallasandram.

## Similarities Between the Sites at Hire Benakal and Mallasandram

In scale, conception and execution, the sites at Hire Benakal and Mallasandram bear an uncanny resemblance to each other, despite the considerable differences in the detailing of individual monuments. This has been noticed by Tilner (2004) also. The near uniformity of scale of the dolmens, the nearly uniform thickness of the slabs and the sheer profusion of dolmens in the visual field at these sites might contribute to this perceived resemblance. But the similarities go further than the merely visual. At Hire Benakal, in the central group (where the large dolmens predominate), there is a water retention feature which seems to be a natural pool that has been enhanced by quarrying (Figure 42), presumably by extracting slabs that went into the construction of the dolmens (Sundara 1975, Bauer 2015). A similar feature is seen in the western cluster at Mallasandram (Figure 43).

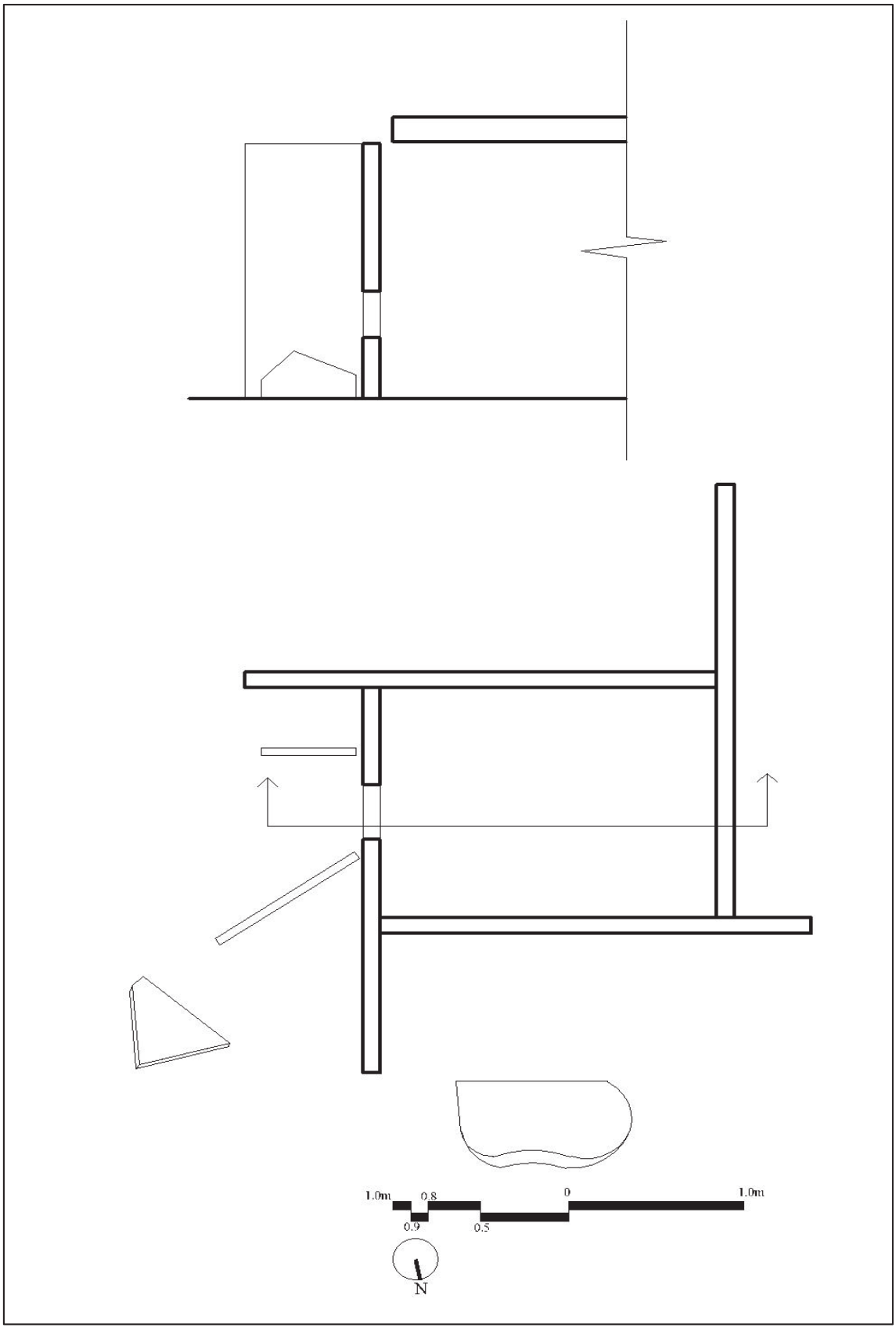


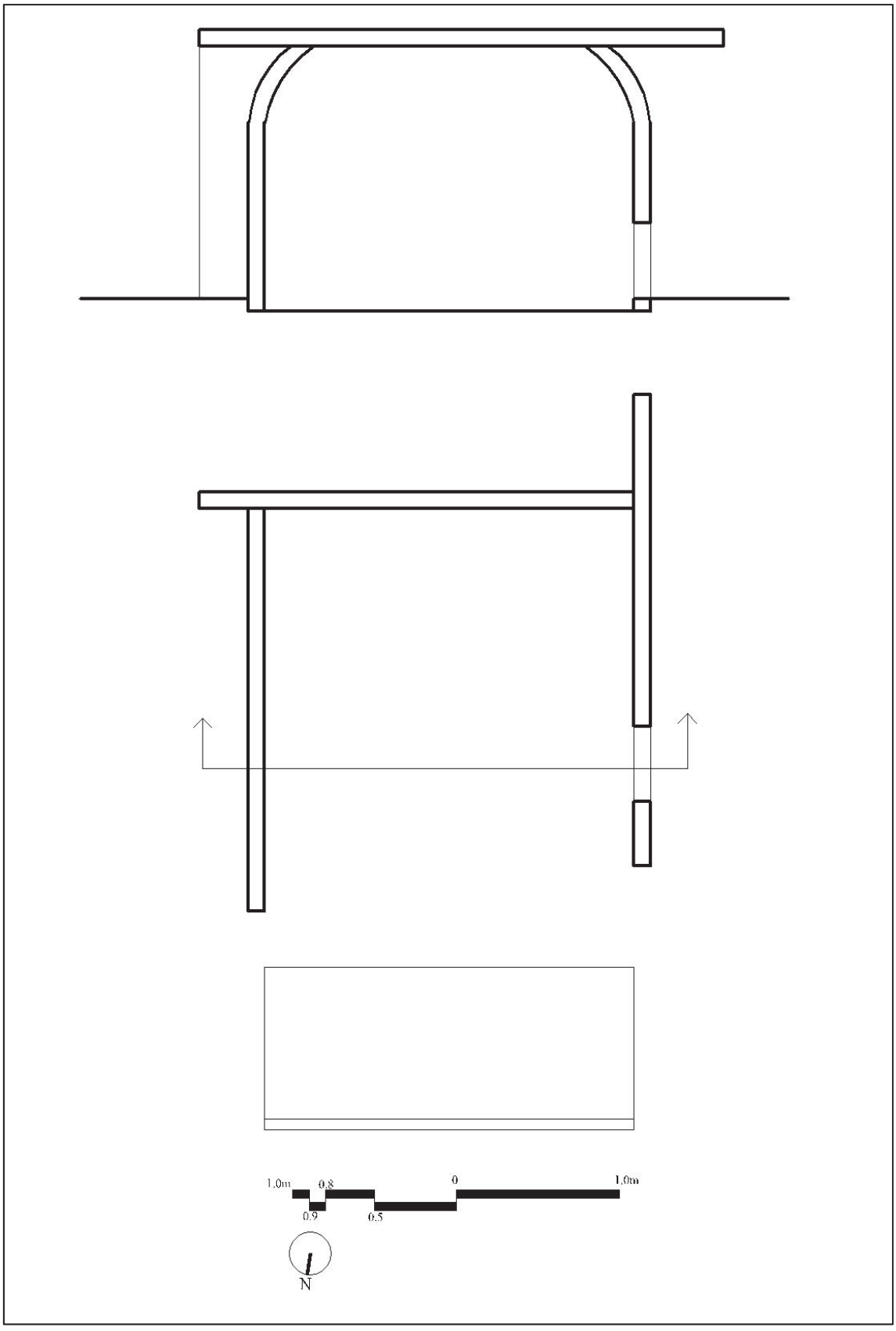

Figure 33: Plan (below) and part-section of the dolmen on the summit at Konaje Kallu

Figure 19: Two short stone slabs flanking the porthole to create a passage

Figure 20: The polished bull-nosed finish of the porthole of the dolmen at the summit of the hill at Konaje Kallu

Figure 21: A view of the only intact dolmen at the megalithic site at Kakkunje

Figure 22: The eastern orthostat is all that remains of this dolmen at Kakkunje




Drawing 38: Plan (below) and section of the dolmen at Kakkunje

Figure 23: The intact dolmen at Kakkunje described in this paper, showing the northern orthostat prised apart

Figure 40: Showing the curvature of the eastern orthostat, which is probably a natural feature of the rock from which this slab was extracted

Figure 41: Showing the curvature of the western orthostat which exhibits evidence of being shaped to mirror the curvature of the eastern orthostat

Figure 42: The natural pool enhanced by quarrying at Hire Benakal

Also, at Hire Benakal, there seems to be a partial segregation of the various types of megalithic structures – with the IPC's dominating in the western group, while the large dolmens dominate the central and eastern groups (Sundara 1975). At Mallasandram, the site consists almost completely of large dolmens with various appendages. However, the nearby megalithic site at Etrapalli (Geo-coordinates: 12° 42′ 09″.2N, 78° 07′ 35″.8E) consists almost entirely of IPC's and a few cairns (Figure 44), begging the question whether this is an example of segregation of megalithic types over a larger landscape scale. This brings to the fore the question whether the differences in form between the IPC's, dolmenoid cists and dolmens represent the different cultural groups which authored them, or whether they are merely the result of socio-economic disparities in the population which built these megaliths. These observations also accentuate the fact that these large megalithic cemeteries are composite monumental sites that were in use and evolved over centuries and a proper study of the chronological evolution of such sites is long overdue.

The major difference between the sites at Hire Benakal and Mallasandram is in orientational preferences. The dolmens (and dolmenoid cists) of Hire Benakal exhibit a wide variety of orientations, a fact noticed even by Keis (Taylor 1941). In contrast, the dolmens of Mallasandram are all uniformly and precisely oriented to cardinal east. This observation, coupled with the obvious architecturally advanced conception of the monuments at Mallasandram, suggest that this site is of a later period than Hire Benakal. Mallasandram seems to be a part of a large group of sites in the region showing similar features, such as Mallelabanda, Iralabanda, etc. (Branfill 1880, Rao 1972, Murthy 1976) In comparison, the two surviving dolmens at Konaje Kallu are both east-facing, while Kakkunje seems to have had both east- (from the one surviving orthostat of a ruined dolmen) and west-facing dolmens.

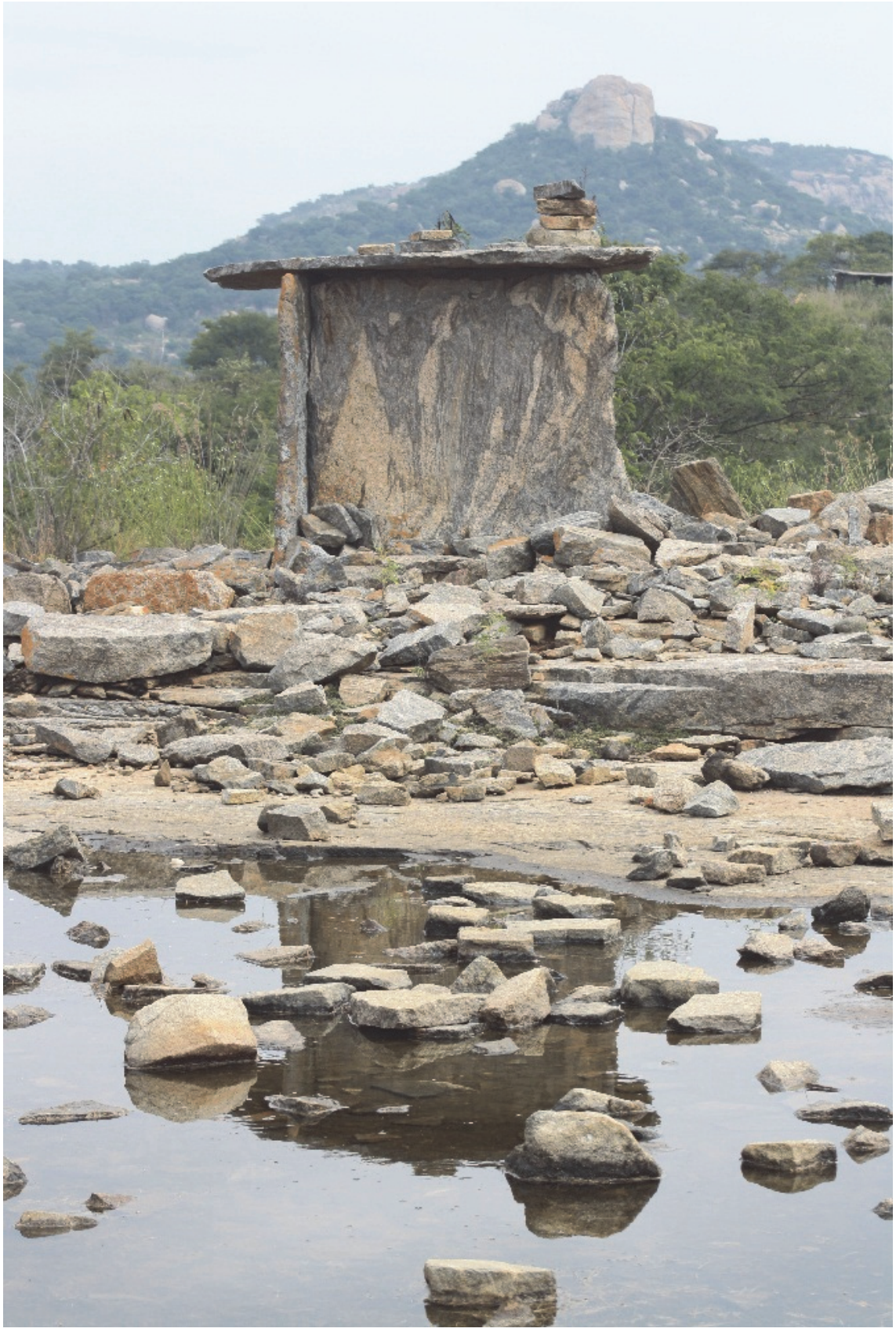


Figure 43: The water retention feature formed by quarrying at Mallasandram

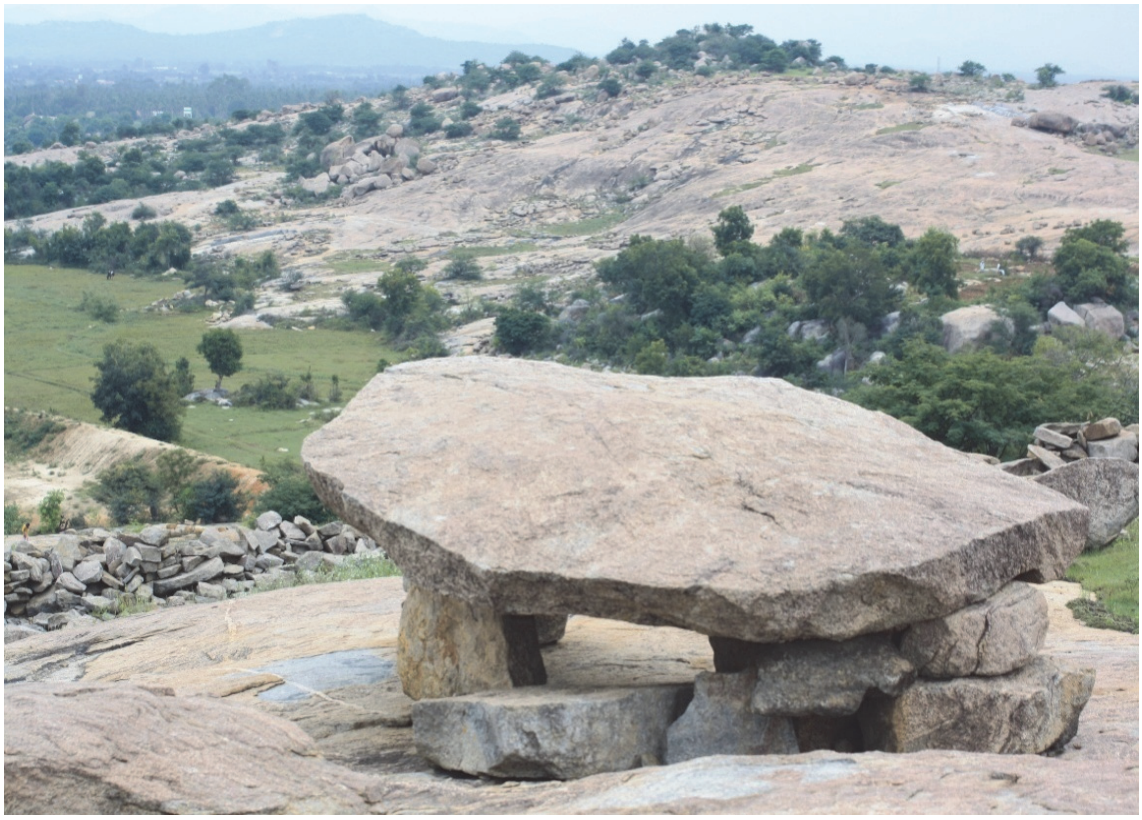


Figure 44: An IPC at the megalithic site of Etrapalli, near Mallasandram

Figure 45: One of the portholes at Hire Benakal, with a roughly perpendicular edge

Figure 46: Another porthole at Hire Benakal, which shows a roughly bevelled edge

Figure 47: The edge of one of the shaped slabs of a slab circle showing hammer dressed edges

## Similarities and Differences in the Individual Dolmens at All Four Sites

From the detailed descriptions and images given above, it is evident why the dolmens at these four sites separated from each other by large geographical distances, can be clubbed under the category "Hire Benakal type" of dolmens. However, despite the overall similarity in conception and execution, there are distinctive differences which may be local contributions. The measurements of the space enclosed by the orthostats at the sites varied considerably from 1.82 $m^2$ at Hire Benakal to just over 5 $m^2$ at Kakkunje. The extending edges of the orthostats beyond the line of the adjoining one, though gives the appearance of a larger monument, especially at Konaje Kallu, where the edges extend for considerable distances. The edges of the slabs were neatly trimmed at Hire Benakal, as also at Mallasandram and Kakkunje, while the edges are extremely irregular in both dolmens at Konaje Kallu. The heights of dolmens (measured from base to bottom of capstone) at Hire Benakal and Mallasandram were quite similar (2.0 m – 2.2 m), while those at the other sites were lower (1.5 m – 1.76 m). The dolmen at Kakkunje, being the lowest (1.5 m) and because the porthole was just above the present surface of the ground, is somewhere between the dolmenoid cist and the dolmen, but was classified as dolmen because of being 0.5m higher than the dolmenoid cists of Hire Benakal.

The portholes were of nearly similar size at Mallasandram and Konaje Kallu (34 – 37 cm in diameter) and the Kakkunje porthole was about 10 cm larger. While the dolmen selected for detailed study at Hire Benakal lacked a porthole, the portholes of other dolmens at the site varied from 34.5 – 43.0 cm in diameter. At Mallasandram, several dolmens with much larger portholes (around 60cm diameter) were noticed. Writing about a similar site atralabanda, near Palamner in Andhra, Branfill (1880) mentions that many of the tombs were then being used for shelter by the members of the Irula tribe after enlarging the portholes and clearing the chambers of their deposits. It is interesting to wonder if similar occupation of some of the Mallasandram dolmens could account for their enlarged portholes.

The selection (deliberate?) of a curved slab for the eastern orthostat of the surviving dolmen at Kakkunje and the deliberate shaping of the corresponding orthostat in the west is the only such example of experimentation on the form of the dolmen known so far. The deliberate polishing of the porthole of the dolmen on the summit at Konaje Kallu is once again an example of how small differences in detailing can be added in different regions. All the portholes at Hire Benakal are either with straight-cut (Figure 45) or bevelled edges (Figure 46). Interestingly both these finishes are suggestive of hammer-dressing by direct or glancing blows to the stone and there is no evidence of use of chisels, etc. For that matter, all the edges of various members at all sites suggest hammer dressing, including the edges of the shaped stones of the slab circles at Mallasandram (Figure 47).

## Conclusions

The dolmens at these four sites exhibit enough similarities to suggest that they were conceived by the same culture, or by cultures with close contacts with each other. While exhibiting the same underlying concept and planning, there are small and large additions or embellishments at various regions, the most dramatic of these being the surrounding slab-circles of Mallasandram. Though it is tempting to hypothesize, based on stylistic differences, that the Hire Benakal monuments are the oldest with the later spread of this cultural trait to other regions leading to alterations and additions to the theme, such a view needs to be backed by further studies on the chronology and evolution at all these sites.

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